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Sent: 11/12/2018 11:02:35 PM
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Subject: RE: EPA Comments - Annual 2017 Groundwater Monitoring Report for The Companies Offsite Operable Unit
Attachments: Morash - OOU 2017 Response to Comments 2018-11-12.pdf

Melanie:

Per our discussion on 17 October, please find attached a response-to-comments letter for the OOU annual groundwater monitoring report. Please let me know if you have any further comments, and we will proceed with incorporating these changes into the 2018 annual report as we discussed.

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From: MORASH, MELANIE <morash.melanie@epa.gov>
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Subject: EPA Comments - Annual 2017 Groundwater Monitoring Report for The Companies Offsite Operable Unit

Dear Victor, Wes, and Nancy-Jeanne,

Thank you for submitting the *Annual Groundwater Monitoring Report January to December 2017* (Report) on behalf of Philips Electronics, Advanced Micro Devices, Inc. (AMD), and TRW Inc., which describes groundwater-monitoring activities related to the Offsite Operable Unit (OOU) of the Triple Site Superfund Site in Sunnyvale, California. The report

submission is required for compliance with Regional Water Quality Control Board Orders 91-102 (AMD), 91-103 (TRW), and 91-104 (Philips) subsequently referred to as the Orders, which remain in effect subsequent to the lead-agency transfer from the State to EPA in August 2014.

EPA appreciates your continued operation and monitoring of the groundwater extraction and treatment system for the OOU, in compliance with the Orders. The following set of comments are being provided for your consideration during the period of "stop-work" for the OOU vapor intrusion effort and Signetics in-situ bioremediation (ISB) study. We recognize that this is a substantial set of feedback, and appreciate your consideration of these items. Please provide a response-to-comments letter and updated Report by **Friday, November 16, 2018**. If this timeframe is not feasible, please identify an alternate submittal date to EPA for approval by Friday, September 21, 2018.

1.0 GENERAL COMMENTS

1. The report excludes groundwater elevation and chemical data reporting for numerous groundwater-monitoring wells in the "A" and "B1" aquifers in the southern portion of the OOU. These data are critical to determine groundwater conditions in the OOU as they are proximal to source areas. These excluded data are presented on select figures, but not presented in data tables used to document and discuss groundwater conditions. Please revise the Report to report and discuss all data within the OOU.

2. The potentiometric surfaces and contaminant contours outside of the OOU are at variance with data reported for adjacent sites. For example, the active groundwater extraction at the nearby AMD 915 DeGuigne Drive Superfund Site is not reflected in the presented contours for the "A", "B1", and "B2" aquifers. Please revise the Report to reconcile data variances with adjacent sites and, if significantly different, present justifications for the interpretation. A preferable alternative is to present and discuss just the OOU data and reference adjacent site data where needed.

3. In accordance with the Orders, reporting shall include identification of potential problems that will, or may, cause non-compliance with the Orders. Accordingly, hydraulic capture of the contaminant plumes is not demonstrated for the hydrostratigraphic units (HSUs) and this issue should be discussed and addressed. Please revise the Report to evaluate the capture zones in accordance with EPA's 2008 guidelines.

4. No discussions of vertical gradients between the HSUs were presented in the Report. Please revise the Report to discuss vertical gradients for each pair of HSUs to document no adverse contaminant migration (i.e. contaminant migration resulting in an increased human health risk) occurring between HSUs.

5. The Report describes groundwater-monitoring activities conducted during the 2017 reporting period, but does not include Remedial Action Objectives (RAOs) of the groundwater monitoring program. Please revise the Report to include and discuss the RAOs.

6. The Report describes quality assurance/quality control (QA/QC) results for groundwater-monitoring activities, but does not reference a parent Quality Assurance Project Plan (QAPP) to which the protocol can be compared. Please revise the Report to reference the parent QAPP, and provide a copy of this QAPP to EPA.

7. Santa Clara Valley Water District is scheduled to conduct improvements of the East Channel and Sunnyvale West Channel that may affect discharge of treated groundwater. Please revise the Report to detail contingency

actions to monitor the contaminant plumes if the extraction system is offline for an extended period of time. If the system is off for an extended period of time and groundwater equilibrated to static conditions, a synoptic groundwater elevation measurement event should be conducted throughout the OOU to determine static groundwater conditions that can be used for comparison to active extraction, and possibly used to recalibrate existing groundwater models.

2.0 SPECIFIC COMMENTS

1. Section 2.1, Page 9 – Groundwater elevation measurements for 10 wells (S067A, S072A, S073A, S075A1, S075A2, S076A, COM03A, COM16A, COM26AH, and COM43A) were included in the Annual Groundwater Monitoring Report January to December 2016 report (Locus, 2017), but not included in the 2017 report. Please revise the Report to discuss the rationale for not obtaining and reporting groundwater elevation data for these wells, especially since groundwater samples were collected from most of these wells for analytical testing.

2. The potentiometric surface contours in Figure 3 for the "A" aquifer appear to be inaccurate, as they do not account for the active groundwater occurring at the AMD 915 Site (Haley Aldrich, 2018a). Please revise the discussion of the "A" aquifer potentiometric surface in the Report to recognize that plume capture is not indicated by the data.

3. Section 2.2.1, Page 9 – Groundwater elevation measurements for seven wells (S072B1, S073B1, S076B1, COM03B1, COM29B1, COM21B1, and COM62B1) were included in the Annual Groundwater Monitoring Report January to December 2016 report (Locus, 2017), but not included in the 2017 report. Please revise the Report to present the rationale for not obtaining and reporting groundwater elevation data for these wells, especially since groundwater samples were collected from these wells for analytical testing.

4. The potentiometric surface contours in Figure 4 appear to be inaccurate, as they do not account for the active groundwater extraction from the "B1" aquifer at the AMD Site 915 (Haley Aldrich, 2018a). Please revise the figure accordingly. EPA concurs that localized significant potentiometric depressions within the "B1" aquifer are evident on Figure 4; however, these localized potentiometric depressions do not necessarily demonstrate plume capture. Please revise the Report to discuss this issue.

5. Section 2.2.2, Pages 9 & 10 – Groundwater elevation measurements for wells COM01B2 and COM03B2 were included in the *Annual Groundwater Monitoring Report January to December 2016* report (Locus, 2017), but not included in the 2017 report. Please revise the Report to present the rationale for not obtaining and reporting groundwater elevation data for these two wells, especially since groundwater samples were collected from these wells for analytical testing.

6. The groundwater elevation at well COM36B2 is anomalously high and was not used in the potentiometric surface reconstruction (Figure 5). The possibility exists that the screened interval of this well does not uniquely reflect hydraulic conditions within the "B2" aquifer. It also appears that contaminant concentration in this well may be anomalous (Figure 14). Please revise the Report to discuss the anomalous hydrogeologic conditions about this well and include procedures to insure integrity of the associated chemical testing.

7. EPA concurs that localized significant potentiometric depressions are evident on Figure 5; however, these localized potentiometric depressions do not demonstrate plume capture. Please revise the Report to discuss this issue.

8. Section 2.2.3, Page 10 – Groundwater elevation measurements for wells COM03B2 and COM06B3 were included in the *Annual Groundwater Monitoring Report January to December 2016* report (Locus, 2017), but not included in the 2017 report. Please revise the Report to discuss the rationale for not obtaining and reporting groundwater elevation data for these two wells, especially since groundwater samples were collected from these wells for analytical testing.

9. The groundwater elevation at well COM36B3 is anomalously high and was not used in the potentiometric surface reconstruction (Figure 6). The possibility exists that the screened interval of this well does not uniquely reflect hydraulic conditions within the "B3" aquifer. Similar to that discussed for well COM36B2, please revise the Report to resolve the anomalous hydrogeologic conditions about this well to insure integrity of the associated chemical testing.

10. Section 2.2.4, Page 10 – EPA concurs that the potentiometric surface contours presented on Figure 7 indicate a general northerly groundwater flow direction throughout most of the OOU. However, the contours east of COM15B4, COM06B4, and T-8D infer a northeast flow direction that does not appear to be justified. Please revise the Report to remove these northeasterly flow directions.

11. Section 3.0, Page 11 – The stated analytical methods 8010 and 8020 are incorrect. The samples were likely analyzed using EPA Method 8260B. Please check the actual laboratory analytical reports (not included in this report) and revise the Report accordingly.

12. Section 3.1, Page 11 – The discussion of contaminants in the "A" aquifer is abbreviated and inadequate. Please revise the Report to include discussions of the general contaminant plume characteristics and significant changes. The extent of the primary contaminant plumes appear to be relatively unchanged as compared to 2016. However, in regard to TCE, the text should address the fact that most tested "A" aquifer wells showed an increase in TCE concentration, which was fairly uniform in all distal downgradient wells.

13. The isocontours presented on Figure 8 do not appear to reflect the data presented. Closed solid contours suggesting known boundary conditions were presented along much of the western plume boundary, about COM49A, and east of COM41A. Please revise the figure to add dashed, dotted, or question marks to the isocontours in these regions to indicate the lack of constraining data. In addition, the TCE and *cis*-1,2-dichloroethene (*cis*-1,2-DCE) contours east of the OOU in the vicinity of the AMD Sites 915 and 901/902 are at variance with data presented by Haley Aldrich (2018a and 2018b) that use a more robust data set. Please revise the Report to reconcile data variances with adjacent sites and justify the interpretation if data for sites outside of the OOU are presented.

14. Analytical testing was not conducted on samples from wells S067A and S074A, both of which were included in the Annual Groundwater Monitoring Report January to December 2016 report (Locus, 2017). Please revise the Report to present the rational for not sampling and testing groundwater from these two wells.

15. Section 3.2.1, Page 11 – Similar to the "A" aquifer discussion, the discussion of contaminants in the "B1" aquifer is abbreviated and inadequate. Please revise the Report to include discussions of the general contaminant plume characteristics and significant changes. The text should also indicate that the plume concentrations and extents did not appreciably change as compared to 2016.

16. The isocontours presented on Figure 11 do appear to reflect the data presented. Closed solid contours suggesting known boundary conditions were presented along the western plume boundary (in the vicinity of San Juan Drive/Blythe Avenue) and north and west of COM63B1. Please revise the Report to add dashed, dotted, or question marks to the isocontours in these regions to indicate the lack of constraining data. In addition, the TCE and cis-1,2-DCE contours east of the OOU in the vicinity of the AMD Sites 915 and 901/902 appear to be at variance with data presented by Haley Aldrich (2018a and 2018b) that use a more robust data set. Please revise the Report to reconcile data variances with adjacent sites and, if significantly different, present justifications for the interpretation.

17. Analytical testing was not conducted on a sample from well S067B1 that was included in the Annual Groundwater Monitoring Report January to December 2016 report (Locus, 2017). Please revise the Report to present the rational for not sampling and testing groundwater from this well.

18. Section 3.2.2, Page 12 - Similar to the other discussion of analytical results, the discussion of contaminants in the "B2" aquifer is abbreviated and inadequate. Please revise the Report to include discussions of the general contaminant plume characteristics and significant changes. The extent of the primary contaminant plumes appear to be relatively unchanged as compared to 2016. However, in regard to TCE, the text should address the fact that most tested "B2" aquifer wells showed an increase in TCE concentration.

19. Please revise the Report to address the "B2" aquifer conditions in the vicinity of well COM36B2. The TCE plume extents westward in this area which appears to be at variance with the depositional trend and regional groundwater flow. Additionally, the potentiometric surface appears to be anomalous in this area. To validate sampling of the "B2" aquifer in this area, these anomalies should be resolved.

20. The isocontours presented on Figure 14 do not appear to correlate with the data presented. A closed solid contour suggesting known boundary conditions was presented along the eastern plume boundary, yet no well is present to the east to constrain the data. Please revise the Report to add dashed, dotted, or question marks to these isocontours along most of the eastern boundary of the plume.

21. The cis-1,2-DCE contours east of the OOU in the vicinity of the AMD Sites 915 and 901/902 appear to be at variance with data presented by Haley Aldrich (2018a and 2018b) that use a more robust data set. Please revise the Report to reconcile data variances with adjacent sites and, if significantly different, present justifications for the interpretation. Also, TCE values for wells 56-DD and 57-DD (Figure 14) appear to be erroneous, thus the 0.005 milligrams per liter (mg/L) TCE in wells vicinity. The contours in the vicinity of the AMD 915 Site should be revised.

22. Section 3.2.3, Page 12 - Similar to the other discussion of analytical results, the discussion of contaminants in the "B3" aquifer is abbreviated and inadequate. Please revise the Report to include discussions of the general contaminant plume characteristics and significant changes. In regard to TCE, the text should address the fact that each of the three wells characterizing the core of the TCE plume (greater than 100 micrograms per liter [µg/L]) exhibited an increase in concentration and the aerial extent of the core of the plume nearly doubled.

23. The isocontours presented on Figure 17 do not appear to correlate with the data presented. Closed solid contours suggesting known boundary conditions were presented along the eastern plume boundary. Please revise the Report to add dashed, dotted, or question marks to the isocontours along the eastern boundaries to indicate the lack of constraining data.

24. Section 3.2.4, Page 12 – Of the three "B4" wells sampled during the reporting period, only COM06B4 contained detectable contaminants with TCE found most recently at 89 µg/L. Historically, this well has shown TCE concentrations generally between 50 and 100 µg/L since 1994. Upgradient well COM15B4 to the south has been continuously sampled since 1987 and has not detected contaminants since 1988. Downgradient well COM53B4 to the north has also been continuously sampled since 1987 and it has not detected contaminants since 1994. Wells COM08B4 and COM09B4 to the west have not been sampled since 1997, but they did not exhibit detectable contaminants. The source of elevated TCE at COM06B4 has yet to be determined and may be situated east of the OOU. Additional data appear to be necessary to define the extent of TCE in the "B4" aquifer and determine the source of TCE at COM06B4. Please revise the Report accordingly, including action items and a plan for addressing these items.

25. Section 4.2, Page 13 – The discussion of the groundwater treatment system and analytical results should be expanded and made more robust. As indicated in the Orders, restoration of OOU groundwater to cleanup criteria was estimated to require 36 years. The system monitoring data presented, and specifically the lack of reduction of influent (i.e. source) contaminant concentrations coupled with the lack of significant plume reduction, indicate that these criteria will not be met in the next nine years. Please revise the Report to discuss the influent concentration from each HSU unit and prepare a trend analysis to evaluate the efficiency of the system. Proposed modifications to increase system efficiency should be presented with justifications and anticipated results.

26. Sections 5.1 and 5.2, Pages 14 and 15 – No QAPP or Sampling and Analysis Plan were referenced to which the QA/QC protocol can be compared. Please revise the Report to reference a QAPP and Sampling and Analysis Plan in accordance with guidance promulgated by EPA (2001) and Intergovernmental Data Quality Task Force (2012) associated with OOU sampling activities.

27. Table 4 – Presented data for the onsite system (Signetics Site) are not applicable to this report. It is unclear where the values for "Total Influent VOC Concentration" belong. Onsite VOC mass removed and Total VOC mass removed cannot be verified by the presented data. Please revise the Report to remove all data that do not belong to offsite treatment system operations.

Sincerely,

Melanie

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References

Haley Aldrich, 2018a, *2017 Annual Groundwater Monitoring Report, 915 DeGuigne Drive, Sunnyvale, California*, January.

Haley Aldrich, 2018b, *Combined 2017 Annual Groundwater Monitoring Report and Annual In Situ Bioremediation Program Report, Former 901/902 Thompson Place, Sunnyvale, California*, January.

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Locus Technologies, 2018, *Annual Groundwater Monitoring Report January to December 2017, The Companies Offsite Operable Unit, Sunnyvale, California.* January 30.

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U.S. Environmental Protection Agency (EPA), 2008, *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems, EPA 600/R-08/003*, January.

EPA, 2001, *EPA Requirements for Quality Assurance Project Plans*, EPA/240/B-01/003, March.

From: Victor Huanambal [mailto:huanambalv@locustec.com]
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Cc: J. Wesley Hawthorne <hawthornej@locustec.com>
Subject: Annual 2017 Groundwater Monitoring Report for The Companies Offsite Operable Unit

Please see the attached Annual 2017 Groundwater Monitoring Report for The Companies Offsite Operable Unit in Sunnyvale, California. Note that unless the word "paper" is following your name in the distribution list below, you will not receive a printed copy of this report. Please contact J. Wesley Hawthorne at (415) 799-9937 or me if you have any questions regarding this transmittal or if you would prefer a printed copy. A copy of the report was uploaded to GeoTracker.

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